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UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner:

Group:

Attorney Docket # 1850

Applicant(s) : HAGER, M., ET AL

Serial No. :

Filed :

For : ELECTRIC MOTOR, IN PARTICULAR FOR RAISING  
AND LOWERING DISKS IN MOTOR VEHICLES

SIMULTANEOUS AMENDMENT

October 18, 2001

Honorable Commissioner of Patents and Trademarks  
Washington, D.C. 20231

S I R S:

Simultaneously with filing of the above identified application  
please amend the same as follows:

In the Claims:

Cancel all claims without prejudice.

Substitute the claims attached hereto.

REMARKS:


This Amendment is submitted simultaneously with filing of the above identified  
application.

With the present Amendment applicant has amended the claims so as to eliminate  
their multiple dependency.

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Consideration and allowance of the present application is most respectfully requested.

Respectfully submitted,

  
Michael J. Striker  
Attorney for Applicant(s)  
Reg. No. 27233

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## Claims

1. Electric motor, in particular for raising and lowering panes in a motor vehicle, with a transmission (11) and a transmission housing (10) and control electronics located in the transmission housing (10) characterized in that the control electronics comprises a, and in particular at least one, printed circuit board (14) which is essentially rectangular and located in the transmission housing (10).
2. Electric motor according to Claim 1, characterized in that the electric motor has a pole housing (12) and a commutator (16) and that the commutator (16) extends out over the pole housing (12).
3. Electric motor according to [the preceding claims] claim 1, characterized in that a brush holder (18) is provided which has a groove (14) or a positive stop (27a) for receiving the printed circuit board (14).
4. Electric motor according to [ the preceding claims] claim 1, characterized in that the suppression elements (34) are provided and that they are located directly on the printed circuit board (14).
5. Electric motor according to [any of the preceding claims] claim 1, characterized in that the printed circuit board (14) can be provided with at least one ASIC (44) having integrated Hall sensors.
6. Electric motor according to Claim 3, characterized in that the brush holder has connection bridges (38) which can be used as plug pins.
7. Electric motor according to [any of the preceding claims] claim 1, characterized in that a pole housing is provided which is joined with the

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transmission housing (10) using three screws.

8. Electric motor according to [any of the preceding claims] claim 1, characterized in that the printed circuit board (14) extends at least over the length of the commutator (16), and in particular extends beyond the commutator (16) by 1.5 times its length or, preferably, 2 or more times its length.
9. Electric motor according to [any of the preceding claims] claim 1, characterized in that the brush holder (14) supports at least one segment (29) along an armature shaft (15), and that this segment extends beyond the printed circuit board (14) and at its end forms at least part of a bearing receptacle (32).
10. Electric motor according to [any of the preceding claims] claim 1, characterized in that the brush holder (18) has holding elements (30) for suppression elements (34).
11. Electric motor according to [any of the preceding claims] claim 1, characterized in that the brush holder (18) has a connector plug (28) which is attached to the printed circuit board (14) using arch or bridge shaped connection bridges (38).
12. Electric motor according to [any of the preceding claims] claim 1, characterized in that the printed circuit board (14) has not conductor paths in the area of the brush sparking on the commutator (16), in particular on the side facing the commutator (16).
13. Electric motor according to [any of the preceding claims] claim 1, characterized in that at least one additional fastening device besides the

groove (27) on the brush holder (18) is provided.

14. Electric motor according to Claim 13, characterized in that the at least one additional attachment of the printed circuit board (14) is by means of the suppression elements (34).
15. Electric motor according to Claim 13, characterized in that the printed circuit board (14) is attached on a segment (29).
16. Electric motor according to [any of the preceding claims] claim 1, characterized in that the essentially rectangular printed circuit board (14) can be inserted into an opening (50) on the transmission housing (10).
17. Electric motor according to [any of the preceding claims] claim 1, characterized in that the printed circuit board (14) is connected to the connection plug (28).
18. Electric motor according to Claim 17, characterized in that a flange connection (52) for connecting the connector plug (28) to the transmission housing (10) is provided.

## Claims

1. Electric motor, in particular for raising and lowering panes in a motor vehicle, with a transmission (11) and a transmission housing (10) and control electronics located in the transmission housing (10) characterized in that the control electronics comprises a, and in particular at least one, printed circuit board (14) which is essentially rectangular and located in the transmission housing (10).
2. Electric motor according to Claim 1, characterized in that the electric motor has a pole housing (12) and a commutator (16) and that the commutator (16) extends out over the pole housing (12).
3. Electric motor according to claim 1, characterized in that a brush holder (18) is provided which has a groove (14) or a positive stop (27a) for receiving the printed circuit board (14).
4. Electric motor according to claim 1, characterized in that the suppression elements (34) are provided and that they are located directly on the printed circuit board (14).
5. Electric motor according to claim 1, characterized in that the printed circuit board (14) can be provided with at least one ASIC (44) having integrated Hall sensors.
6. Electric motor according to Claim 3, characterized in that the brush holder has connection bridges (38) which can be used as plug pins.
7. Electric motor according to claim 1, characterized in that a pole housing is provided which is joined with the transmission housing (10) using three

screws.

8. Electric motor according to claim 1, characterized in that the printed circuit board (14) extends at least over the length of the commutator (16), and in particular extends beyond the commutator (16) by 1.5 times its length or, preferably, 2 or more times its length.
9. Electric motor according to claim 1, characterized in that the brush holder (14) supports at least one segment (29) along an armature shaft (15), and that this segment extends beyond the printed circuit board (14) and at its end forms at least part of a bearing receptacle (32).
10. Electric motor according to claim 1, characterized in that the brush holder (18) has holding elements (30) for suppression elements (34).
11. Electric motor according to claim 1, characterized in that the brush holder (18) has a connector plug (28) which is attached to the printed circuit board (14) using arch or bridge shaped connection bridges (38).
12. Electric motor according to claim 1, characterized in that the printed circuit board (14) has not conductor paths in the area of the brush sparking on the commutator (16), in particular on the side facing the commutator (16).
13. Electric motor according to claim 1, characterized in that at least one additional fastening device besides the groove (27) on the brush holder (18) is provided.
14. Electric motor according to Claim 13, characterized in that the at least one additional attachment of the printed circuit board (14) is by means of

the suppression elements (34).

15. Electric motor according to Claim 13, characterized in that the printed circuit board (14) is attached on a segment (29).
16. Electric motor according to claim 1, characterized in that the essentially rectangular printed circuit board (14) can be inserted into an opening (50) on the transmission housing (10).
17. Electric motor according to claim 1, characterized in that the printed circuit board (14) is connected to the connection plug (28).
18. Electric motor according to Claim 17, characterized in that a flange connection (52) for connecting the connector plug (28) to the transmission housing (10) is provided.